Claims

Claim 1. An electro-mechanical transducer comprising:

a magnetic assembly producing a magnetic field, that field having two or more displaced regions of greater intensity, those regions having magnetic flux in substantially similar directions, and separated by and surrounded by regions of lower-intensity magnetic field; and

an electrically-conductive and mobile member disposed in the magnetic field capable of moving through the magnetic field.

Claim 2. An electro-mechanical transducer comprising:

a magnetic assembly producing a magnetic field, that field having two or more linearly-displaced regions of greater intensity, those regions having magnetic flux in substantially similar directions, and separated by and surrounded by regions of lower-intensity magnetic field; and

an electrically-conductive and mobile member disposed in the magnetic field capable of moving linearly through the magnetic field.

Claim 3. An apparatus of Claim 1 as an electro-acoustic transducer with:

a supporting frame;

an acoustic-radiating diaphragm attached to and moving with the electrically conductive and mobile member.

an air seal at the edge of the diaphragm; and

a suspending element to provide restoring force to the moving parts.

Claim 4. An apparatus of Claim 3, whose magnetic assembly is created by a central pole, back plate, magnetic material and top plate.

Claim 5. An apparatus of Claim 4, whose pole and/or top plate are each made of single pieces of ferromagnetic material shaped to create the stated non-uniform magnetic field.

Claim 6. An apparatus of Claim 4, whose pole and/or top plate are each made of multiple pieces of ferromagnetic material shaped to create the stated non-uniform magnetic field.

Claim 7. An apparatus of Claim 4, wherein the top plate is shaped to produce the regions of varying magnetic intensity.

Claim 8. An apparatus of Claim 4, wherein the pole is shaped to produce the regions of varying magnetic intensity.

Claim 9. An apparatus of Claim 4, wherein both the top plate and center pole are shaped to produce the regions of varying magnetic intensity.

Claim 10. An apparatus of Claim 9, wherein the top plate and center pole include opposing surface grooves.

Claim 11. An apparatus of Claim 10, with an inter-gap magnetic field intensity of substantially zero magnitude.

Claim 12. An apparatus of Claim 10, with an inter-gap magnetic field intensity of non-zero magnitude.

Claim 13. An apparatus of Claim 10, with a magnetic field intensity outside the main gap region of substantially zero magnitude.

Claim 14. An apparatus of Claim 10, with a magnetic field intensity of non-zero magnitude.

Claim 15. An apparatus of Claim 10, with the magnetic field intensity between the gaps and those outside the main gap region of substantially similar size and/or magnitude.

Claim 16. An apparatus of Claim 10, with the magnetic field intensity between the gaps and those outside the main gap region of substantially different size and/or magnitude.

Claim 17. An apparatus of Claim 1, wherein at least one region of high magnetic intensity is of magnitude and/or size substantially similar to that in other regions.

Claim 18. An apparatus of Claim 1, wherein at least one region of high magnetic intensity is of magnitude and/or size substantially different from that in other regions.

Claim 19. An apparatus of Claim 1, with more than one field.

Claim 20. An apparatus of Claim 1, with nonmagnetic material in at least one region of lower flux.

Claim 21. An apparatus of Claim 1, with paramagnetic material in at least one region of lower flux.

Claim 22. An apparatus of Claim 1, with diamaterial in at least one region of lower flux.

Claim 23. An apparatus of Claim 1, with ferromagnetic material in at least one region of lower flux.

Claim 24. An apparatus of Claim 1, with electrically conductive material in at least one region of lower flux.

Claim 25. An apparatus of Claim 1, with passively-energized, electrically-conductive non-magnetic material in the region of lower flux.

Claim 26. An apparatus of Claim 1, with externally-energized, electrically-conductive non-magnetic material in the region of lower flux (i.e. coil of wire).

Claim 27. An apparatus of Claim 1, wherein regions of multiple flux maxima are repeated in an axially-displaced location but with flux in the opposite direction, thereby creating a structure having 4 or more regions of greater intensity and half of which have flux opposite that of the other half, each grouping having its own attendant coil.

Claim 28. An apparatus of Claim 9, wherein the pole has additional grooves beyond those in the top plate.

Claim 29. An apparatus of Claim 9, wherein the top plate has additional grooves beyond those in the pole.

Claim 30. An apparatus of Claim 3, wherein the pole and/or top plate are shaped to produce multiple regions of varying magnetic intensity of different dimensions.

Claim 31. An apparatus of Claim 1, whose magnetic assembly is created by a central pole, back plate, and magnetic material with a field arranged so as to eliminating the need for a top plate.

Claim 32. An apparatus of Claim 1 with:
a supporting frame;
a suspending element to provide restoring force to the moving parts.

Claim 33. An apparatus of Claim 32 as an electro-acoustic transducer, with an acoustic-radiating diaphragm attached to and moving with the electrically conductive and mobile member.